Public Health and Preventive Medicine

Injury Mortality in New Mexico's American Indians, Hispanics, and Non-Hispanic Whites, 1958 to 1982

C. MACK SEWELL, DrPH; THOMAS M. BECKER, MD; CHARLES L. WIGGINS, MSPH; CHARLES R. KEY, MD; HARRY F. HULL, MD; *and* JONATHAN M. SAMET, MD, *Albuquerque*

This is one of a series of articles from western state public health departments.

New Mexico has extraordinarily high injury mortality rates. To better characterize the injury problem in New Mexico, we calculated proportionate injury mortality and age-adjusted and age-specific injury mortality rates for the state's 3 major ethnic groups—American Indians, Hispanics, and non-Hispanic whites. According to death certificate data collected from 1958 to 1982 and US population census figures, age-adjusted mortality rates for total external causes varied widely between the sexes and among the ethnic groups. Males in each ethnic group consistently had higher average annual age-adjusted external mortality rates than females. Injury mortality rates for American Indians of both sexes were 2 to 3 times higher than those for the other New Mexico ethnic groups. Motor vehicle crashes were the leading cause of death from injury for all 3 groups. Homicide accounted for twice the proportion of injury death in Hispanic compared with non-Hispanic white males (12.5% and 6.1%, respectively), while the proportion of males dying of suicide was highest in non-Hispanic whites. Deaths from excessive cold and exposure were leading causes of injury mortality for American Indians, but these causes were not among the leading causes of injury mortality for Hispanics or non-Hispanic whites. We conclude that the minority populations in New Mexico are at high risk for injury-related death and that the major causes of injury mortality vary substantially in the state's predominant ethnic populations.

(Sewell CM, Becker TM, Wiggins CL, et al: Injury mortality in New Mexico's American Indians, Hispanics, and non-Hispanic whites, 1958 to 1982. West J Med 1989 Jun; 150:708-713)

In recent years, injury has been increasingly recognized as a major national public health problem, being associated with significant morbidity and mortality and consuming substantial proportions of health expenditures.[1] More than 140,000 Americans die of injuries each year, and 70 million suffer nonfatal injuries.[2,3] Direct and indirect costs associated with injuries in the United States have been estimated at $75 to $100 billion per year.[1] In the United States, injuries rank as the fourth leading cause of death at all ages and as the leading cause of death for persons aged 1 to 44 years.[4] While motor vehicle crashes account for the majority of injury mortality, other causes—such as falls, drowning, fires, poisoning, homicides, and suicides—also account for a substantial loss of life.

New Mexico has the second highest injury mortality rate in the nation; only Alaska's rate is higher.[5] In 1985 the New Mexico death rate for all injuries almost doubled the US death rate (94.4 versus 58.1, respectively, per 100,000 population).[6] New Mexico's motor vehicle fatality rate, consistently among the nation's highest for all states since 1950,[7] makes a large contribution to the state's high injury mortality rate. New Mexico, however, is also burdened by high injury mortality rates from many other causes, including both unintentional and intentional (homicide and suicide) injuries.[8-12]

The epidemiology of many diseases has been shown to differ among members of New Mexico's three major ethnic groups—American Indians, Hispanics, and non-Hispanic whites. Although infectious and chronic disease mortality rates have been shown to vary substantially among the state's major population groups,[13-15] the epidemiology of injury mortality has not been adequately examined. Some published data indicate that Hispanics have higher injury mortality rates than non-Hispanic whites in the Southwest.[6,8,9,12] In addition, southwestern American Indians, who comprise about a tenth of the state's population, have injury mortality rates that far exceed those for US whites.[6,8,16-18] The specific

From the Office of Epidemiology, New Mexico Health and Environment Department, Santa Fe (Drs Sewell and Hull); the Departments of Family, Community, and Emergency Medicine (Dr Sewell), Medicine (Drs Becker and Samet), Pathology (Dr Key), and Pediatrics (Dr Hull), and the New Mexico Tumor Registry (Dr Becker, Mr Wiggins, Dr Key, and Dr Samet), University of New Mexico School of Medicine, Albuquerque.

This study was supported by the Flinn Foundation and by contract No. N01-CN-55426 of the Biometry Branch, National Cancer Institute.

Reprint requests to Thomas M. Becker, MD, Department of Medicine, Cancer Center, UNM School of Medicine, Albuquerque, NM 87131.

causes of injury mortality in these minority groups have not been well characterized, and most reports have been limited by short observation periods.

To better characterize the total injury problem in New Mexico, we calculated proportionate injury mortality and age-adjusted and age-specific injury mortality rates for New Mexico's American Indians, Hispanics, and non-Hispanic whites for the years 1958 to 1982. This report summarizes the descriptive epidemiology of injury mortality in New Mexico over this 25-year period.

Methods

We obtained coded death certificate data for New Mexico residents for the years 1958 to 1982 from the New Mexico Bureau of Vital Statistics. The cause of death was coded according to the seventh revision of the *International Classification of Diseases* (ICD) for the years 1958 to 1968,[19] the eighth ICD revision for the years 1969 to 1978,[20] and the ninth ICD revision for the years 1979 to 1982.[21] Deaths were assigned to accidents and other external causes if coded as E800 to E999.9 for ICD-7, ICD-8, and ICD-9. Because many cause-specific codes changed from ICD-7 to ICD-9, a list of the appropriate ICD codes for each revision (and time period) was prepared and used for subsequent analyses (Table 1).

Ethnicity was assigned by the Bureau of Vital Statistics on the basis of information contained on individual death certificates. Hispanic ethnicity was determined on the basis of the decedents' surnames, the surnames of the decedents' parents, and from specific statements on the death certificate. American Indians were identified solely on the basis of information cited on the death certificate. Non-Hispanic whites were persons whose race was coded as white and who did not have a Spanish surname or other information to indicate that they were Hispanic. We did not examine injury mortality among blacks or other ethnic or racial groups because of the small number of deaths. These exclusions accounted for only 3% of New Mexico's population.

The validity of this approach for classifying ethnicity has not been formally evaluated by the Bureau of Vital Statistics. Therefore, we validated the assignment of ethnicity by comparing the ethnicity of lung cancer patients as stated in their responses to ethnic identification questions in a case-control study[22] with death certificate classification by the Bureau of Vital Statistics. We found 96.4% agreement between self-identification of Hispanic ethnicity and the coding of ethnicity on 221 death certificates and 98.3% agreement between self-identification as non-Hispanic white and the coding on 291 death certificates.

Denominators were derived from the censuses of 1960,[23-25] 1970,[26-28] and 1980.[29] Estimates of the American Indian population for 1960 were adjusted to account for systematic errors that occurred in data processing.[25] The Hispanic white populations for 1960 and 1970 were adjusted to account for different enumeration procedures from 1960 through 1980.

In the censuses of 1960, 1970, and 1980, the US Census Bureau employed different techniques to identify Hispanic ethnicity.[24,26,29] Based on a survey of Hispanics in New Mexico,[30] we adjusted the estimates of the Hispanic populations from the 1960 and 1970 censuses to establish comparability with the 1980 census of the Hispanic population.

To better present the magnitude of the problem of injury-related mortality in New Mexico, we focused on proportionate mortality for each ethnic group. Age-specific and age-adjusted mortality rates were also calculated for five-year periods—1958 to 1962, 1963 to 1967, 1968 to 1972, 1973 to 1977, and 1978 to 1982. Age-adjusted rates were calculated by the direct method and standardized to the 1970 US standard population. The analyses were done with standard software packages from the Statistical Analysis System.[31]

TABLE 1.—*Cause-Specific* International Classification of Diseases *(ICD) Codes for Injury-Related Events, 1958 to 1982*

Cause	ICD 7th 1958-1968	ICD 8th 1969-1978	ICD 9th 1979-1982
Total external	E800-962	E800-949	E810-949
Traffic crashes	E810-825	E810-819	E810-819
Homicide	E964, E980-983	E960-969	E960-969
Suicide	E963, E970-979	E950-959	E950-959
Falls	E900-904	E880-887	E880-888
Drowning	E929	E910	E910
Poisoning	E870-888	E850-869	E850-866
Aspiration of food	E921	E911	E911
Fires and burns	E916	E890-899	E890-899
Airplane crashes	E860-866	E840-845	E840-845
Firearms (accidental)	E919	E922	E922
Excessive cold	E932	E901	E901
Exposure or neglect	E933	E904	E904
Struck by falling object	E910	E916	E916

Results

Age-adjusted mortality rates for total external causes varied widely between the sexes and among the three major ethnic groups in New Mexico (Figures 1 and 2). Males of all ethnic groups consistently had higher average annual age-adjusted mortality rates than females. Among males, American Indians consistently had the highest rates, followed by Hispanics and non-Hispanic whites. American Indian females also had the highest injury mortality rates, with lower rates in non-Hispanic whites and similar rates in Hispanics. The mortality rates for American Indians of both sexes were typically two to three times higher than those for the other New Mexico ethnic groups. Mortality rates in American

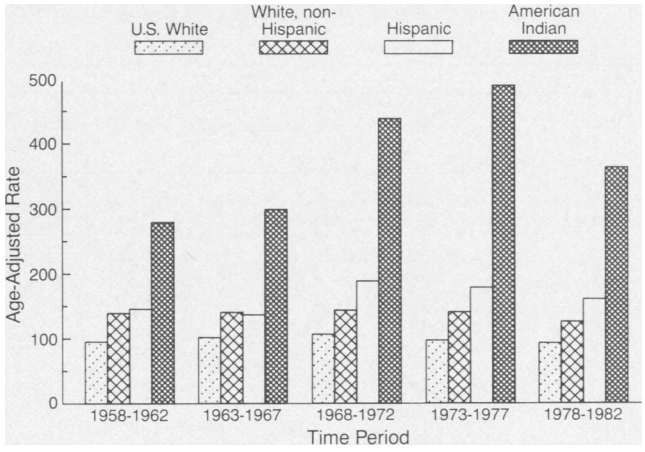

Figure 1.—The graph shows the average annual age-adjusted mortality rate per 100,000 population from total external causes in American Indian, Hispanic, and non-Hispanic white men and boys in New Mexico, 1958 to 1982. The rates for US whites are from the mid-year of the interval.

Indians were two to five times higher than age-adjusted external mortality rates in US whites within comparable time periods.

Of the ten leading causes of external mortality in the years 1958 to 1982 for New Mexico, motor vehicle crashes were the leading cause of external mortality for all three ethnic groups (Tables 2 and 3). Nonetheless, substantial differences in the remaining causes of external mortality occurred among the three ethnic groups. Homicide, suicide, falls, drowning, and fire- and burn-associated deaths accounted for large numbers of deaths for both sexes in all ethnic groups. Homicide accounted for twice the proportion of external causes of death in Hispanics compared with non-Hispanic white men (12.5% and 6.1%, respectively). In non-Hispanic white men, almost 20% of the deaths from external causes were from suicides, a much larger proportion than in Hispanic (11.6%) and in American Indian (10.0%) men. While airplane crashes accounted for 4.2% of non-Hispanic white male deaths and were the fifth ranking cause of external mortality in this ethnic group, airplane crash-related mortality did not appear in the ten leading causes of external death for American Indian or Hispanic males. Among American Indians, deaths due to excessive cold and exposure or neglect were important causes of mortality, while these conditions were not among the ten leading causes for Hispanics or for non-Hispanic whites. When excessive cold and exposure or neglect categories were combined, the resulting combination was the third and fourth leading cause of external mortality for American Indian males and females, respectively.

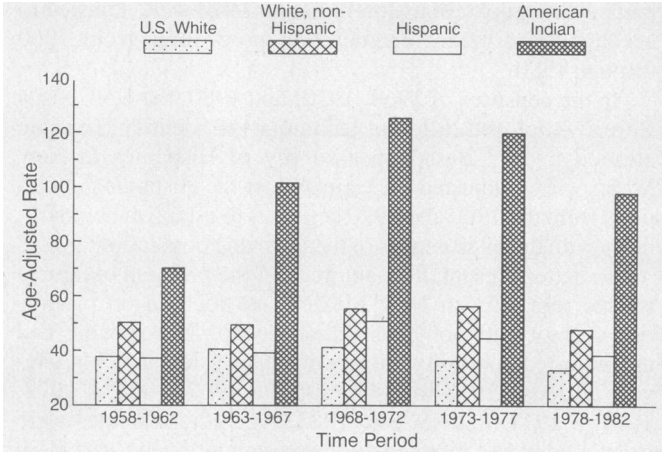

Figure 2.—The graph shows the average annual age-adjusted mortality rate per 100,000 population from total external causes in American Indian, Hispanic, and non-Hispanic white women and girls in New Mexico, 1958 to 1982. The rates for US whites are from the mid-year of the interval.

Mortality rates for males in the 15- to 44-year age group due to external causes are presented by five-year time periods in Table 4. We examined the rates for males in this age range because injuries were the predominant cause of death in this group, and the rates changed rapidly over time. The rates for women, children, and persons older than 45 years were much lower and generally stable across all time periods.

TABLE 2.—*Leading Causes of Injury Mortality for American Indian, Hispanic, and Non-Hispanic White Males in New Mexico, 1958 to 1982*

	Ethnic Group							
Rank	*American Indians*	*No.*	*(%)*	*Hispanics*	*No.*	*(%)*	*Non-Hispanic Whites*	*No.*	*(%)*
1	Traffic crashes	1,496	(47.4)	Traffic crashes	3,200	(42.3)	Traffic crashes	3,621	(36.5)
2	Suicide	316	(10.0)	Homicide	946	(12.5)	Suicide	1,948	(19.7)
3	Homicide	256	(8.1)	Suicide	875	(11.6)	Falls	627	(6.3)
4	Excessive cold	171	(5.4)	Drowning	348	(4.6)	Homicide	603	(6.1)
5	Drowning	163	(5.2)	Falls	315	(4.2)	Airplane crashes	413	(4.2)
6	Exposure or neglect	112	(3.5)	Poisoning	250	(3.3)	Fires and burns	306	(3.1)
7	Falls	103	(3.3)	Fires and burns	213	(2.8)	Drowning	303	(3.1)
8	Aspiration of food	63	(2.0)	Firearms (accidental)	186	(2.5)	Firearms (accidental)	252	(2.5)
9	Poisoning	58	(1.8)	Aspiration of food	150	(2.0)	Poisoning	175	(1.8)
10	Fires and burns	21	(0.7)	Struck by falling object	116	(1.5)	Aspiration of food	156	(1.6)
	Other unintentional injury	399	(12.6)	Other unintentional injury	969	(12.8)	Other unintentional injury	1,506	(15.2)
	Total	3,158	(100.0)		7,568	(100.0)		9,910	(100.0)

TABLE 3.—*Leading Causes of Injury Mortality for American Indian, Hispanic, and Non-Hispanic White Females in New Mexico, 1958 to 1982*

	Ethnic Group							
Rank	*American Indians*	*No.*	*(%)*	*Hispanics*	*No.*	*(%)*	*Non-Hispanic Whites*	*No.*	*(%)*
1	Traffic crashes	535	(50.7)	Traffic crashes	819	(41.0)	Traffic crashes	1,384	(35.2)
2	Homicide	92	(8.7)	Falls	202	(10.1)	Suicide	667	(17.0)
3	Fires and burns	56	(5.3)	Homicide	193	(9.6)	Falls	656	(16.7)
4	Falls	48	(4.5)	Suicide	178	(8.9)	Homicide	285	(7.2)
5	Suicide	37	(3.5)	Drowning	97	(4.8)	Poisoning	132	(3.4)
6	Excessive cold	29	(2.7)	Fires and burns	96	(4.8)	Fires and burns	128	(3.2)
7	Drowning	28	(2.7)	Aspiration of food	85	(4.2)	Aspiration of food	97	(2.5)
8	Aspiration of food	21	(2.0)	Poisoning	71	(3.6)	Drowning	87	(2.2)
9	Exposure or neglect	19	(1.8)	Firearms (accidental)	28	(1.4)	Airplane crashes	55	(1.4)
10	Poisoning	15	(1.4)	Struck by falling object	5	(0.2)	Firearms (accidental)	32	(0.8)
	Other unintentional injury	176	(16.7)	Other unintentional injury	224	(11.2)	Other unintentional injury	406	(10.3)
	Total	1,056	(100.0)		1,998	(100.0)		3,929	(100.0)

Discussion

We have examined the injury mortality experience in New Mexico over a 25-year period. During this period, age-adjusted external mortality rates for males among New Mexico's three principal ethnic groups exceeded the external mortality rates for US white males (Figure 1). While the rates for American Indians overshadowed those in all other ethnic groups, injury mortality rates in New Mexico's Hispanic and non-Hispanic white males were also well above rates observed nationally for white males. Age-adjusted external mortality rates in females showed a pattern similar to those in males, even though the rates were well below male rates (Figure 2). As was observed among males, mortality rates for American Indian females far exceeded rates among females in the other ethnic groups. These ethnic differences in injury mortality may be partially due to differences in economic status.[5]

Mortality from injuries is a serious health problem in New Mexico. Injuries are the third ranking cause of death in the state and the leading cause of years of potential life lost before age 65. Nationally, injury deaths account for more than 40% of years of potential life lost before age 65[32]; in New Mexico, the proportion of years of potential life lost resulting from injury is even higher (45%).[33] Unintentional injuries accounted for most of the injury mortality in New Mexico from 1958 to 1982. Motor vehicle crashes were the leading cause of injury mortality in all of New Mexico's principal ethnic groups (Tables 2 and 3). This pattern is consistent with injury mortality patterns found nationally and shows the importance of motor vehicle crashes as the single leading cause of preventable death. The proportion of external mortality due to motor vehicle crashes varied from a low of 36% in non-Hispanic whites to almost 50% of external mortality in American Indians. While motor vehicle fatality rates have been declining in New Mexico for many years, these rates remain well above the national figures.[34] Motor vehicle crashes in New Mexico are frequently related to alcohol consumption—55% to 65% of all motor vehicle fatalities involve alcohol.[34] Although data on the proportion of alcohol-involved vehicle fatalities from other states are scant, New Mexico is thought to have one of the highest proportions in the nation (Howard Graff, MS, New Mexico Traffic Safety Bureau, oral communication, June 1988). A disproportionately high use of alcohol among American Indians in New Mexico may contribute to their elevated motor vehicle mortality rates compared with Hispanics and non-Hispanic whites.[35]

Falls, drowning, poisoning, and fire and burns were among the ten leading causes of external mortality for both sexes and all ethnic groups. Airplane crashes accounted for a small proportion of deaths in non-Hispanic whites, but this cause of death was not among the ten leading causes for either American Indians or Hispanics. This ethnic pattern is probably related to the generally lower economic status of American Indians and Hispanics, with the resultant lack of opportunity to fly small aircraft. Deaths related to the combined categories of excessive cold and exposure or neglect were the third and fourth ranking causes of external deaths in American Indian males and females, respectively, but these causes of death were not among the ten leading causes for either Hispanics or non-Hispanic whites. A previous study in New Mexico has shown a high rate of American Indian deaths due to excessive cold and exposure or to pedestrians being struck by motor vehicles.[36] Alcohol use was a major risk factor in these deaths. A smaller number of deaths occurred in all ethnic groups from the aspiration of food. The proportions of deaths caused by aspirating food have declined substantially in the past several years. It is not clear what factors might have influenced this decrease.

Intentional injuries (homicide and suicide) accounted for

TABLE 4.—*Age-Specific Mortality Rates per 100,000 Population From Total External Causes in American Indian, Hispanic White, and Non-Hispanic White Males in New Mexico, 1958 to 1982*

Age Group, yr	Ethnic Group	1958-1962	1963-1967	1968-1972	1973-1977	1978-1982
15-19	American Indian	223.1	135.8	419.4	476.7	373.7
	Hispanic	157.4	151.6	215.1	225.5	172.3
	Non-Hispanic white	115.5	131.8	168.3	186.8	155.2
	US white	88.5	99.4	116.1	117.1	121.3
20-24	American Indian	406.5	420.1	634.2	871.9	662.1
	Hispanic	243.8	212.9	342.7	307.7	317.2
	Non-Hispanic white	160.9	154.1	185.1	235.2	220.0
	US white	118.1	133.9	156.1	150.6	160.7
25-29	American Indian	513.3	465.2	534.3	821.7	538.3
	Hispanic	183.7	160.2	250.9	262.6	280.0
	Non-Hispanic white	174.5	129.7	149.4	156.2	184.5
	US white	93.1	106.6	120.5	122.0	134.0
30-34	American Indian	380.5	323.8	492.6	536.2	381.0
	Hispanic	174.1	111.0	240.6	220.7	248.9
	Non-Hispanic white	183.6	137.0	125.0	164.9	143.2
	US white	82.2	95.7	106.5	100.7	108.1
35-39	American Indian	362.9	370.1	553.7	765.2	470.2
	Hispanic	138.1	135.8	194.6	231.3	232.8
	Non-Hispanic white	169.3	153.7	133.3	131.7	154.1
	US white	84.6	95.8	105.7	99.7	97.8
40-44	American Indian	325.3	378.7	509.3	525.7	531.3
	Hispanic	125.4	127.1	215.4	219.9	180.8
	Non-Hispanic white	183.5	164.4	165.6	116.2	119.9
	US white	90.0	98.5	108.0	98.7	94.5

substantial proportions of the external mortality in all of the state's ethnic groups. The high proportion of suicides in non-Hispanic whites contrasts sharply with the proportion of external deaths due to suicide in American Indians and Hispanics. Nonetheless, high suicide rates have been reported among New Mexico's young American Indian men,[37] especially among the Apaches. The high proportion of deaths in Hispanics due to homicides exceeded that of American Indians and non-Hispanic whites. In the Southwest, homicide rates among young Hispanic men triple the rates for non-Hispanic white men.[38] Data from the New Mexico Office of the Medical Investigator show that about half of the homicides and suicides in the state in 1985 were associated with alcohol use (alcohol detected at a blood concentration of greater than 0.005%).[39] In addition, data from the Office of the Medical Investigator point to the central role of firearms in homicides and suicides in New Mexico. In all, 48% of the homicides and 54% of the suicides in New Mexico in 1985 involved the use of firearms.[39]

Alcohol abuse is a major public health problem and a strong contributor to injury mortality in New Mexico. According to the National Institute on Alcohol Abuse and Alcoholism, New Mexico ranks second in the nation, after Nevada, in the rate of alcohol-related mortality.[40] Studies have shown that the rates in New Mexico far exceed national rates for causes of death that are completely attributable to alcohol use—that is, alcoholic psychoses, the alcohol dependence syndrome, nondependent abuse of alcohol, alcoholic liver disease, alcoholic cardiomyopathy, alcoholic polyneuropathy, alcoholic gastritis, and accidental poisoning with alcohol.[41] Mortality rates directly attributable to alcohol use among New Mexicans are nearly twice the rates in the US population as a whole, and among New Mexicans, alcohol-related mortality rates in American Indians and Hispanics far exceed the rates in non-Hispanic whites. In the 15- to 24-year-old age group, the mortality rate attributable to alcohol use is 50 times greater in American Indians compared with non-Hispanic whites, and the mortality rate for Hispanics is 5 times higher than among non-Hispanic whites in the state.

Long-term temporal improvements in emergency medical response, transport, and care have undoubtedly improved survival for injuries that would have proved fatal only a few years ago. The implementation of regional trauma systems elsewhere has resulted in substantially improved trauma care and reduced death rates due to trauma.[42] New Mexico has only recently implemented an organized, regional trauma care system, and its effect on injury mortality has not been evaluated. Decreases in fire- and burn-associated deaths have been shown to be related to dramatic improvements in burn care.[43]

Possible limitations and biases in this study include the misclassification of the cause of death, age, sex, year of death, and ethnic status. Age, sex, and year of death were likely to have been misclassified only rarely. Misclassifying the cause of death from injury is probably much less common than misclassifying for many other causes of death, however, as most injury-related deaths occur within a short period of time following a traumatic event.[5] Misclassifying the ethnic group may have affected our calculations of ethnic-specific rates. For the numerators of the mortality rates, ethnicity was assigned by the New Mexico Bureau of Vital Statistics with procedures that were constant over the study period. The designation of American Indian on the basis of stated race or death certificate information should closely parallel the self-identification of race used by the US Census Bureau, on which our denominators were based. Separating Hispanic whites from non-Hispanic whites is more of a potential problem. For Hispanics, the Bureau of Vital Statistics considered surname and parents' surnames as well as statements on the death certificates. We did, however, find a high level of concordance (greater than 96%) between self-reported Hispanic-white ethnicity among subjects who participated in a statewide case-control lung cancer study from 1980 through 1982[22] and the code assigned by the Bureau of Vital Statistics to deceased subjects. This observation suggests that the misclassification of Hispanics was not a major source of bias in the study.

Because most injuries are preventable, we conclude that a substantial loss of life could be prevented in New Mexico if high-risk groups were targeted and appropriate intervention strategies developed to reduce the number of unnecessary injury-related deaths. Additional measures to increase seatbelt use and decrease the incidence of driving while intoxicated are priorities. Studies examining the risk of mortality in New Mexico from motor vehicle crashes, homicide, suicide, drowning, falls, and excessive cold or exposure are warranted.

REFERENCES

1. Committee on Trauma Research, National Research Council and the Institute of Medicine: Injury in America. Washington, DC, National Academy Press, 1985
2. Multiple Causes of Death in the United States, Monthly Vital Statistics Report, Vol 32. Hyattsville, Md, National Center for Health Statistics, 1984. US Dept of Health and Human Services (DHHS) publication No. (PHS) 84-1120, p 13
3. Current Estimates from the National Health Survey, United States. Vital Health Stat [10] 1981; 141. Hyattsville, Md, National Center for Health Statistics, 1982. US DHHS publication No. (PHS) 82-1569
4. National Center for Health Statistics: Advance report of final mortality statistics, 1980. Monthly Vital Stat Rep 1983; 31 (Sep):22-26
5. Baker SP, O'Neill B, Karpf RS: The Injury Fact Book. Lexington, Mass, DC Heath & Co, 1984
6. Vital Statistics Bureau: Leading Causes of Death—Monthly Vital Statistics Report. Santa Fe, New Mexico Health and Environment Department, Feb 1986
7. Vital Statistics Bureau: Motor Vehicle Accident Fatalities—Monthly Vital Statistics Report. Santa Fe, New Mexico Health and Environment Department, Jan 1984
8. Davis S, Ledman J, Kilgore J: Drownings of children and youth in a desert state. West J Med 1985; 143:196-201
9. Vital Statistics Bureau: Homicide in New Mexico—Monthly Vital Statistics Report. Santa Fe, New Mexico Health and Environment Department, Feb 1983
10. Vital Statistics Bureau: Accidental Fall/Fracture Fatalities—Monthly Vital Statistics Report. Santa Fe, New Mexico Health and Environment Department, Apr 1985
11. Vital Statistics Bureau: Suicide Fatalities—Monthly Vital Statistics Report. Santa Fe, New Mexico Health and Environment Department, Dec 1983
12. Vital Statistics Bureau: New Mexico Poisoning Mortality—Monthly Vital Statistics Report. Santa Fe, New Mexico Health and Environment Department, Nov 1984
13. Samet JM, Key CR, Kutvirt DM, et al: Respiratory disease mortality in New Mexico's American Indians and Hispanics. Am J Public Health 1980; 70:492-497
14. Key CR: Cancer Incidence and Mortality in New Mexico, 1973-77. Surveillance, Epidemiology, and End Results: Incidence and Mortality Data, 1973-77 (Monograph 57). Bethesda, Md, National Cancer Institute, 1981. US DHHS publication No. 81-2330
15. Vital Statistics Bureau: 1985 New Mexico Selected Health Statistics. Santa Fe, New Mexico Health and Environment Department, Jul 1987
16. Brown RC, Gurunanjappa BS, Hawk RJ, et al: The epidemiology of accidents among the Navajo Indians. Public Health Rep 1970; 85:881-888
17. Carr BA, Lee ES: Navajo Tribal mortality: A life table analysis of the leading causes of death. Soc Biol 1978; 25:279-287
18. Simpson SG, Reid R, Baker SP, et al: Injuries among the Hopi Indians: A population-based survey. JAMA 1983; 249:1873-1876
19. Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death. Based on the recommendations of the Seventh Revision Conference, 1955. Geneva, World Health Organization (WHO), 1957
20. Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death. Based on the recommendations of the Eighth Revision Conference, 1965. Geneva, WHO, 1967
21. Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death. Based on the recommendations of the Ninth Revision Conference, 1975. Geneva, WHO, 1977

22. Humble CG, Samet JM, Pathak DR, et al: Cigarette smoking and lung cancer in 'Hispanic' whites and other whites in New Mexico. Am J Public Health 1985; 75:145-148

23. US Bureau of the Census: Census of the Population: 1960—General Population Characteristics. Final Report, New Mexico, PC(1)-33B. Washington, DC, Government Printing Office, 1961

24. US Bureau of the Census: Census of the Population: 1960—Subject Reports: Persons of Spanish Surname. Final Report PC(2)-1B. Washington, DC, Government Printing Office, 1963

25. US Bureau of the Census: Census of the Population: 1960—Subject Reports: Nonwhite Persons By Race. Final Report PC(2)-1C. Washington, DC, Government Printing Office, 1963

26. US Bureau of the Census: Census of the Population: 1970—General Population Characteristics. Final Report, New Mexico, PC(1)-C33. Washington, DC, Government Printing Office, 1971

27. US Bureau of the Census: Census of the Population: 1970—General Social and Economic Characteristics. Final Report, New Mexico, PC(1)-C33. Washington, DC, Government Printing Office, 1971

28. US Bureau of the Census: Census of the Population: 1970—Subject Reports. Final Report, American Indians, PC(2)-1F. Washington, DC, Government Printing Office, 1973

29. US Bureau of the Census: Census of the Population: 1980—General Population Characteristics. Final Report, PC 80-1-B33, New Mexico. Washington, DC, Government Printing Office, 1981

30. Becker TM, Wiggins CL, Key CR, et al: Ischemic heart disease mortality in Hispanics, American Indians, and non-Hispanic Whites in New Mexico, 1958-1982. Circulation 1988; 78:302-309

31. SAS User's Guide: Statistics, version 5 edition. Cary, NC, SAS Institute, 1985

32. Centers for Disease Control: Table 5—Years of potential life lost, deaths, and death rates, by cause of death, and estimated number of physician contacts, by principal diagnosis, United States. MMWR 1982; 31:599

33. Vital Statistics Bureau: New Mexico Years of Potential Life Lost—Monthly Vital Statistics Report. Santa Fe, New Mexico Health and Environment Department, Jun 1985

34. New Mexico Crash Data, 1986. Santa Fe, New Mexico Highway and Transportation Department, Traffic Safety Bureau, Jul 1987

35. May P: Alcohol and drug misuse prevention programs for American Indians: Needs and opportunities. J Stud Alcohol 1986; 47:187-195

36. Fleming D, Braun M, Sheline J, et al: Prohibition on the Reservation—Does It Increase Native American Mortality? Presented at Epidemic Intelligence Service Conference, 1986, Atlanta, Centers for Disease Control

37. Van Winkle NW, May PA: Native American suicide in New Mexico, 1957-1979: A comparative study. Human Organization 1986; 45:296-309

38. Homicide Surveillance: High Risk Racial and Ethnic Groups—Blacks and Hispanics, 1970 to 1983. Atlanta, Centers for Disease Control, 1986

39. Office of the Medical Investigator: Annual Report. Albuquerque, University of New Mexico School of Medicine, 1985

40. County Problem Indicators, 1975-1980, US Alcohol Epidemiologic Data Reference Manual, Vol 3. Washington, DC, National Institute on Alcohol Abuse and Alcoholism, Sep 1985

41. Epidemiology Report: Mortality Directly Related to Alcohol in New Mexico, 1980-1984. Santa Fe, New Mexico Health and Environment Department, Office of Epidemiology, Mar 1986

42. Cales RH: Trauma mortality in Orange County: The effect of implementation of a regional trauma system. Ann Emerg Med 1984; 13:1-10

43. Alexander JW: Burn care: A specialty in evolution—1985 Presidential Address, American Burn Association. J Trauma 1986; 26:1-6